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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/020,986	12/19/2001	Jae Yong Park	049128-5052	1161
9629	7590	03/18/2005	EXAMINER ROY, SIKHA	
MORGAN LEWIS & BOCKIUS LLP 1111 PENNSYLVANIA AVENUE NW WASHINGTON, DC 20004			ART UNIT 2879	PAPER NUMBER

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,986	PARK ET AL.	
	Examiner	Art Unit	
	Sikha Roy	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The Appeal Brief filed January 24, 2005 has been entered.

The finality of the last action is withdrawn because of reconsideration of the application and a new action is presented as follows.

Claim Objections

Claim 26 is objected to because of the following informalities:

The term "smoothly transfers heat" in claim 26 is objected because it is not clear what the applicant means by 'smoothly'. The specification does not provide any guidance for ascertaining the meaning of 'smoothly transferring heat' and hence one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Appropriate clarification of 'smoothly transferring heat' is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4 – 6, 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art in view of U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,195,142 to Gytoku et al.

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Referring to claim 1 applicants' admitted prior art discloses (specification page 4 Fig. 1) an electroluminescent device comprising a transparent substrate 1, a plurality of pixel areas including plurality of scanning lines and data lines formed on the substrate, plurality of pixel electrodes 2a formed on the plurality of pixel areas, electroluminescent layer 3 formed over the pixel electrodes, a metal electrode 4 formed on the electroluminescent layer, a protective film 5 over the metal electrode, a seal cover plate 7 for sealing the EL layer and a sealant 6 for adhering the seal cover plate 7 to the transparent substrate 1.

The applicants' admitted prior art does not disclose the heat-exhausting layer formed on the metal electrode.

Yang in analogous art of organic polymer displays discloses (abstract, column 2 lines 5-10 Fig. 2C) an organic polymer EL display with a heat exhaust (dissipating) layer 28 formed on the metal electrode (cathode). It is to be noted that heat generated during the operation of the display results in disintegration of the organic layers limiting the lifetime of the display. Yang discloses that by using this heat-dissipating layer the heat generated by the EL display can be dissipated and hence the lifetime of the display can be enhanced.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the heat exhaust layer formed on the metal electrode between the metal electrode and the protective film, as taught by Yang to the electroluminescent display disclosed by applicants' admitted prior art for dissipating heat generated by the EL display and hence enhancing its life.

Referring to claim 1, applicants' admitted prior art and Yang fail to disclose the protective film having multi-layer structure of at least a moisture-absorbing layer and a moisture-proof layer.

Gyotoku in analogous art of organic electroluminescence element discloses (column 4 lines 32-46, column 7 lines 33-36, column 9 lines 1-15 Fig.6) an organic electroluminescent element having a protective film of laminate film of two layers (7a,7b) or more having an insulating compound GeO, SiO, SiO₂ (known as silica gel which is moisture absorbing) in the lowest layer and a metal film formed on the insulating compound layer. Gyotoku discloses that in this configuration of protective film, invasion of moisture (moisture proof) into the cathode or organic thin film is completely shut-off, growth of dark spots on the luminous layer is prevented, thereby presenting an organic electroluminescent element capable of suppressing gradual decline of luminance. Gyotoku further notes (column 9 lines 53-57) that this two-layer structure of the protective layer can be formed easily and transitional decline of luminance can be effectively prevented.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the protective film of applicants' admitted prior art and Yang to a protective film of laminate of two or more layers having moisture absorbing and moisture proof layers as taught by Gyotoku for easy formation of the protective layer and preventing transitional decline of luminance of the electroluminescent element due to invasion of moisture.

Regarding claims 4-6, applicants' admitted prior art discloses (Fig.1 page 4 [0013]) a moisture absorbing agent 8 formed of fine powder containing any one of BaO, CaCO₃, silica-gel, alumina is provided at the inside of the seal cover plate opposed to the metal electrode to absorb moisture and oxygen from the electroluminescent layer. It is further disclosed (page 4 lines 9-11) a supporting film 9 formed from semi-transmitting film is used for adhering the moisture absorbing agent to the inner side of the seal cover.

Regarding claim 9, here the applicant is claiming the product of electroluminescent device including a method (i.e. a process) of making the heat-exhaust layer, consequently, claim 9 is considered "product-by-process" claim. In spite of the fact that a product-by-process claim may recite only process limitations, it is the product and not the recited process that is covered by the claim. Further, patentability of a claim to a product does not rest merely on the difference in the method by which the product is made. Rather, is the product itself which must be new and not obvious. As such, no patentable weight has been given to the process recited in claim 9 (see MPEP 2113).

Claims 10,11,13-15 and 18,19-21,25 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art in view of U.S. Patent 6,383,048 to Yang et al.

Regarding claim 10 applicants' admitted prior art discloses all the limitations except a heat-exhausting layer formed on the seal cover plate.

Yang in Embodiment 1 discloses (Figs. 2C, 2D column 3 lines 1-4, 21-24 column 4 lines 14-27) a heat-exhausting layer (packaging shell with plurality of grids or metal layer inside) 29 made of metals of high thermal conductivity is formed on top of the layer 28 which is sealing the OLED and thus enhances the effect of heat dissipation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include a heat-exhausting layer as taught by Yang on the seal cover plate of the EL device of applicants' admitted prior art for enhancing the effect of heat-dissipation from the device.

Regarding claim 11 the applicants' admitted prior art discloses (page 4 line 8 Fig.1) a protective film 5 is formed on the metal electrode 4.

Claim 13-15 recite the same limitations as of claims 4-6 and hence are rejected for the same reasons (see rejection of claims 4-6).

Claim 18 recites the same limitations as of claim 9 and hence is rejected for the same reason (see rejection of claim 9).

Referring to claim 19 applicants' admitted prior art discloses all the claimed limitations except for the heat exhausting layer formed on the protective film.

Yang in Embodiment 2 discloses (Fig. 3D column 4 lines 42-60) a heat exhausting layer (covering layer) 40 consisting of a high thermal conductivity metal such as copper deposited on top of the protective film 38 (film 38 preventing the second electrode and luminant layer from reacting with oxygen and moisture in the air). Yang further notes that this layer enhances the effect of heat dissipation.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the heat exhausting layer deposited on the protective film of applicant's admitted prior art as taught by Yang for enhancing the effect of heat-dissipation from the device.

Referring to claim 20 the applicants' admitted prior art discloses (Fig. 1) the seal cover plate provided on the protective film 5 and a sealant for adhering the seal cover plate to the transparent substrate. As the protective film has the heat exhaust layer formed on the protective film, it would have been obvious to specify the seal cover plate provided on the heat exhaust layer sealing the electroluminescent layer and adhered to the transparent substrate by a sealant.

Regarding claim 21, the heat exhaust layer being formed on the protective film, protects the protective film underneath.

Claim 25 recites the same limitations as of claim 9 and hence is rejected for the same reason (see rejection of claim 9).

Claim 26 - 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art in view of U.S. Patent 5,811,177 to Shi et al.

Claim 26 differs from applicants' admitted prior art in that applicants' admitted prior art does not disclose a metal thin film provided on the seal cover plate.

Shi in relevant art of electroluminescent organic devices discloses (Figs. 4,5 column 3 lines 40-63, column 4 lines 5-30) discloses a metal thin film layer 26 (low permeability inorganic layer of a stable metal such as aluminum) under the seal plate

30. Shi further discloses this metal film has low permeability of oxygen and moisture and hence yields overall structure with a better encapsulation and resistance to permeation.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to provide a thin metal film under the seal cover plate of the device of applicants' admitted prior art as taught by Shi et al. for better encapsulation of the device.

The recitation of 'the metal thin film provided under the seal cover plate to smoothly transfer heat' has not been given patentable weight because is considered an intended use recitation. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ 2d 1647 (1987).

Claims 27 - 29 recite the same limitations as of claims 4-6 and hence are rejected for the same reasons (see rejection of claims 4-6) as disclosed in applicants' admitted prior art.

Referring to claim 30 Shi discloses the metal thin film adhering the entire surface of the seal cover plate.

Regarding claims 31 and 32 the applicants' admitted prior art and Shi disclose the claimed invention except for the metal thin film adhering to the portion of the seal cover where the moisture-absorbing agent and the sealant are not formed. It would

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have been an obvious matter of design choice to have the metal thin film adhering to the portion of the seal cover where the moisture-absorbing agent and the sealant are not formed since the applicant has not disclosed that this design of the thin metal film solves any stated problem and it appears that the invention would perform equally well with the thin film covering the entire seal cover plate.

Regarding claim 33 applicants' admitted prior art discloses (page 4 lines 14-17, Fig. 1) the sealant for adhering the seal cover plate and the metal film is epoxy resin which is known in the art to be an ultra-violet hardening (curing) resin.

Claims 12 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art and U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,195,142 to Gytoku et al.

Regarding claims 12 and 22 applicants' admitted prior art and Yang do not exemplify the protective film having single-layer or multi-layer structure of moisture absorbing or moisture-proof layer.

Gytoku discloses in Fig. 5 the protective layer 7 having a single layer structure having insulating compound layer of GeO, SiO, SiO₂ (known as silica gel which is moisture absorbing).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include moisture-proof layer as taught by Gytoku in the protective film of the applicants' admitted prior art and Yang for preventing moisture penetration and

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oxidation of the electron-injecting electrode and hence enhancement of stable driving period of the organic EL device.

Claims 7,8 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art, U.S. Patent 6,383,048 to Yang et al. and U.S. Patent 6,195,142 to Gytoku et al. and further in view of U.S. Patent 6,180,176 to Gledhill et al.

Referring to claims 7 and 8 Yang discloses a high thermal conductivity material used for heat exhaust layer but do not disclose the heat exhausting material formed of carbon group material.

Gledhill in pertinent art of providing elastomer surfaces on supporting substrates discloses (column 10 lines 9-18) coating of carbon dag or graphite used for heat absorbent properties.

The selection of known materials for a known purpose is generally considered to be within the skill of the art. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the heat exhaust layer of Yang formed of carbon material for its heat-absorbent properties as disclosed by Gledhill because the selection of known material for a known purpose is within the skill the art.

Regarding claim 8 Gledhill discloses (column 5 lines 33-35) graphite film used commercially as heat absorbent coating. The reason for combining art as in claim 7 applies.

Claims 16,17 and 23,24 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicants' admitted prior art and U.S. Patent 6,383,048 to Yang et al. and further in view of U.S. Patent 6,180,176 to Gledhill et al.

Claim 16, 17 recite the same limitations as of claims 7,8 respectively and hence are rejected for the same reasons (see rejection of claims 7,8).

Claim 23, 24 recite the same limitations as of claims 7,8 respectively and hence are rejected for the same reasons (see rejection of claims 7,8).

Response to Arguments

Applicant's arguments with respect to claims 1 and 10 have been considered but are not persuasive.

In response to Applicants' arguments with respect to claim 1 that Gyotoku never teaches nor suggests that the metal layer 7b of the protective layer can be used as moisture proof layer the examiner respectfully disagrees. Gyotoku discloses (column 9 lines 1-19) with the metal film 7b (second layer in the protective film 7) the invasion of moisture or oxygen into the cathode or organic film is completely shut off and hence this layer is indeed moisture proof.

In response to applicant's arguments that Yang discloses a different type of EL device the examiner respectfully disagrees. Yang discloses (Fig. 2B column 3 lines 57-

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67) the same type of organic EL device 200 (with ITO anode electrode, luminant PPV layer 24 and cathode electrode) as that disclosed by the applicant. Furthermore Yang discloses in embodiment 1 the layer 28 sealing the EL device and the heat exhausting layer (packaging layer 29 with grids) formed on the seal layer 28, enhancing the heat dissipating effect.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,696,178 to Igarashi discloses materials such as Al, Cu for protective layers may be as long as they have the function of inhibiting promoters of device deterioration such as water entering the device. U.S. patent 6,734,625 to Vong et al. and U.S. Patent 6,765,351 to Forrest et al. disclose protective film with multilayers.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (571) 272-2463. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

S.R.
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